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Determinants of User Adoption of e-Government Services in Greece and the role of Citizen Service Centres

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Abstract

The aim of this research is to investigate citizens' behaviour and the role of 'Citizen Service Canters' (CSCs) in e-Government adoption. The ultimate aim is to contribute to the understanding of the user's intention drivers or barriers at the local government level in adoption and diffusion of e-Government realms in Greece, building a theory and proposing a validation research framework, by using a quantitative research approach. It validates the UTAUT model in the Greek context focusing on the importance of CSCs as intermediaries. A SEM validation of the proposed model reveals that 'performance expectancy', 'effort expectancy', 'trust of intermediary' played by CSCs, 'trust of the government', 'trust of internet', and finally 'social influence' are key drivers influencing directly or indirectly the user's intention. At the practical level, the research aims to help e-Government policy decision makers and web designers to better plan, design and implement policies and strategies to increase the take up of e-Government services.

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Keywords: e-Government; e-Government adoption; Citizen Service Centres; UTAUT

1. Introduction

A number of initiatives have been achieved by the Greek government to assist e-Government and ICT adoption and diffusion. These initiatives were driven by European Union (EU) funding, on respective actions through the Community Support Framework (CSF) periods [1]. Since the late 1990s, initiated from the EU funding and

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guidelines, Greek government has cultivated its web presence by establishing web portals to offer electronic service delivery to their citizens. That period, being in line with the above, the national e-Government modernisation agenda included the establishment of the Citizen Service Centers (CSCs -KEP in Greek) concept to facilitate government service delivery and seamless interaction to citizens. The concept of using a third party to facilitate access to a product or service can offer several benefits to the recipients [2]. When taken in the context of public services, these offices are acting as intermediaries; they also help increase accessibility of e-services, by offering more points of availability of services for the public. Secondly, the use of a CSC supports the training and education needs of citizens by facilitating the assisted use of technology; this enables the gradual transition of citizens to 'self-using' new technology [3]. Moreover, this business model can be technology-driven and is scalable, as public adoption rates increase. This way Greek government would be able to make steps forward to electronic age, bridging digital divide and encourage Greek citizens to participate and use e-services.

Nowadays there are 1086 CSCs running under the supervision of Greek municipalities, operate all over the country and mostly work on behalf of citizens as a front-end of government agencies to deliver seamless e-services [4]. Therefore there is an increased convenience for both citizens and businesses in using the CSCs as a multi-service vending facility [2]. So far, they have provided mostly face-to-face contact with citizens and enjoyed their trust [5]. They are gradually being transformed to e-CSCs, following government legislation and technical requirements in terms of security, data protection and electronic transactions.

Although Greek government has invested heavily in e-Government implementation, there have been varying results and delayed outcomes. The empirical findings illustrate that the adoption and diffusion of e-Government in Greece comes second last, in the 27 EU countries [6]. This paper highlights factors that facilitate or impede Greeks' conducts in using e-services and the role of CSCs. The remainder of this article is organized as follows. In section 2 the most important models in e-Government adoption are mentioned or described in brief. Section 3 is devoted on the extended UTAUT model and the research method is presented. In section 4 results are reported and discussed, while in section 5 the weaknesses of the project are mentioned. Finally, the implications of the study are in section 6.

2. Literature review

Research in IS, in the topic of e-Government has done much to improve the e-Government adoption by the end users. Recently, various theories and models have emerged on new technology and e-Government dissemination and explain adequately the phenomenon under investigation (i.e.,TAM, TPB, DOI, UTAUT). TAM has received extensive support through validations, applications and replications for its power to predict use of Information Systems (IS) and is considered to be the most robust and influential model explaining IS adoption behaviour [7]. On the other hand, it has been found that TAM excludes some important sources of variance and does not consider challenges such as time or money constraints as factors that would prevent an individual from using an information system.

On the other hand TPB is an extension of TRA in which the factor PBC has been added. It has been designed to predict behaviour across many setting, and can be applied to IS use. It delivers more specific information, measuring the system's performance on various outcomes (e.g., factors that might be barriers to system use). The DOI model has been designed with the goal to analyse the characteristics of technology adopters. Studies tend to apply it, to the adoption of technology for performing job roles and as such may not be as valid when applied to consumers.

Researchers are also confronted with a choice among a multitude of models. Hence, a new model was developed to address these limitations, which is named as the Unified Theory of Acceptance and Use of Technology (UTAUT) model and the aim of the model was to understand intention/usage as the dependent variable [8]. The UTAUT model combines the previous eight theoretical models and is made up of four key factors intention ('Performance Expectancy', 'Effort Expectancy', 'Social Influence', and 'Facilitating Conditions') that act as determinants of behavioural intention and usage behaviour. Also, UTAUT posits the role of four key moderator variables (Age, Gender, Experience, and Voluntariness of use). It has been tested in four different organizational settings for a period of six months and the study [8] showed significant prediction of usage. Moreover, UTAUT model has been found to be preferred to the abovementioned theoretical models as it is able to account for a high percentage of the variance (R^2) in usage intention [8].

Even if the UTAUT model seems appropriate for the e-Government adoption in Greece by the citizens, there are remaining determinants not fully explored to be applicable for the Greek context.The reason is that e-Government acceptance depends on various factors that differentiate among different group members, particularly with regard to expectations, cultural variations, level of use and interaction, and commitment to the e-Government initiatives. Thus research with an extended UTAUT model is needed.

3. The Research

This study following a quantitative approach uses a survey to understand citizens' perspectives regarding the role of CSCs in e-Government adoption. A conceptual model was created by extending the UTAUT theoretical model with the trust and internet experience factors. 'Trust' is defined as expectancy that the promise of an individual or group can be relied upon [9]. It is reported to be a key enabler in impersonal situations with a level of uncertainty, and online environments are no exception. Lack of trust is one of the most important barriers to e-service adoption, especially when personal or financial information is involved [10, 11, 12]. Recent studies [12] of online behaviour emphasize the importance of including 'Trust' in adoption models to gain a more comprehensive understanding of user acceptance of electronic services; moreover, the interpretation power of the models is reported to get improved.

In literature, there is distinction between types of trust [7]. Among the many listed, the ones related to this study are: (a) 'Party-based Trust' or 'Trust in Government' that refers to trust in a certain trustee; in G2C setting refers to trust in the government institution providing the e-service [13], in our case the CSCs. This is of crucial importance for the Greek case because 66% of people do not trust government and local government organizations [14]. On the contrary Greeks trust the CSCs. (b) 'Institutional Trust' which is trust stemming from environmental conditions and is defined as a sense of safety caused by the impersonal structures [7]. The internet – being the infrastructure of e-Government – is still a source of uncertainty for some countries and the citizens' lack of trust would affect the use of e- services [15].

3.1. The model

All the constructs in the proposed model and the relations between them can be seen in the figure 1. The model places the constructs used in previous literature into the consistent theoretical framework provided by UTAUT. A measurement instrument (questionnaire) was created to empirically validate the proposed model. The items of the questionnaire were partly based on previous empirical studies and the rest were adopted from [7] reworked to be suitable for the context of this study, along with some items (i.e, 'Trust of the Internet', 'trust of the Government' and 'Trust of the CSC') adopted from [15]. Finally, the rest of the items were collected from literature about intermediaries and some were self-developed.

Five-point likert scales were employed for all these constructs. The questionnaire was translated from English to Greek and back translated to ensure consistency. The (45) resulting items were reviewed to ensure that the meaning was preserved through adoption and translation.

The instrument was pretested to a convenience sample of 43 people multiple e-Government users varying in age, gender, educational level, and internet usage to verify its appropriateness and comprehensiveness. Cronbach's alpha was used to test the instrument for items with low reliability values. The α tests revealed that the instrument had to be refined, after which six items had to be removed, leaving 39 items. The refined instrument had also to be altered to eliminate misunderstandings, following respondents' feedback.

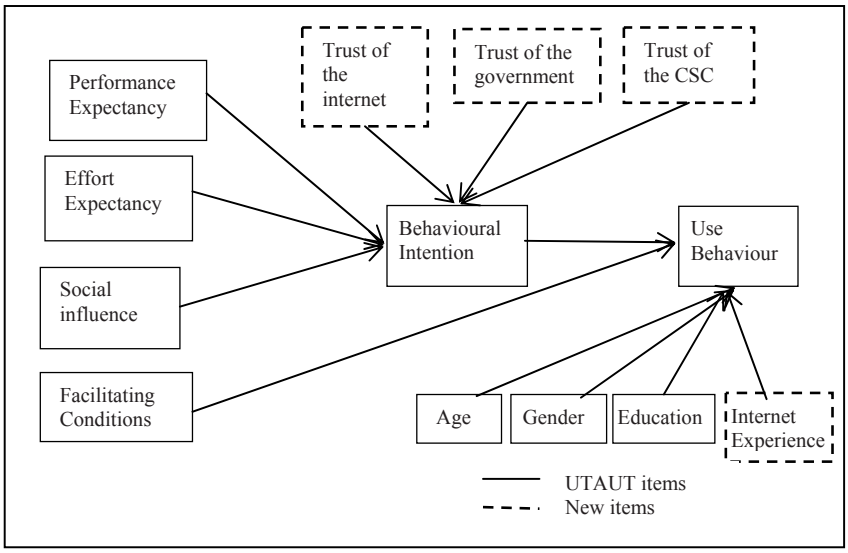

Fig. 1: The model in SEM notation

3.2 *Conducting the survey*

The municipality of Heraklion was selected to be used in this experiment. It is a large city in population terms in Crete region and www.heraklion.gr its official portal. The rationale for selecting it is because of its importance, in terms of e-Government in Greece. Over the last years, the Heraklion e-Government initiative has operated a set of different e-Government projects and it scores high in the e-Government agenda in Greece. For two consequently years 2012 and 2013, Helaklion city was announced 'smart21 community' of the world, by Intelligent Community Forum.

The selected sampling method is convenience sampling (i.e., non-probability). All participants were Heraklion citizens and familiar with the internet, to obtain more reliable results. To access a large number of participants, students of different disciplines at University of Crete and citizens at an age ranging from 18 to 50 years old, were targeted. The participation in the experiment was done on a voluntary basis and all respondents were familiar with the specific website since a familiarisation task was involved. The instrument was administered over a period of two months and a total of 224 valid responses were returned. Generally, a large sample size is necessary to minimise the chance factor [16]. For PLS, to avoid the problem of biased results, the sample size should be at least 10 times the largest number of independent constructs affecting a dependent construct, with a recommended minimum of 45 [17].

The questionnaire also collected basic demographic data, and data concerning participants' e-Government experience, through six questions.

3.3 Data analysis

After the data collection, a data screening process and a demographic analysis were conducted. Out of 224 respondents 115 were female, 109 male. The age of respondents ranged from 18 to 55 with a mean of 35.47 and a median age of 33.22. 22% of the respondents reported high school education level, 58% college degree while 20% had a masters or higher degree. 55% of them were very frequent internet users, 41% were frequent users and only 4% were beginners in using internet. 67% used the internet solely for informational purposes and only 23% used it to conduct transactions. 49% of the respondents reported that they did not use any e-Government services, whereas 51% reported that they used them. Then a descriptive analysis process was conducted; this included an exploratory factor analysis.

Afterwards, the SEM analysis was executed using the PLS (Smart-Pls) tool. It included the measurement model

analysis and the structural model analysis. Within the measurement model analysis, the validity and reliability of the research items and constructs were assessed. Within the structural model analysis, the testing of the significance of paths was conducted.

4. The Results

The R^2 value represents the predictive power of the model and the model was successful in predicting the intentions. The R^2 value of intention for this new model was 0.651, which means that the model explains 65.1% of the variation in the data. The most important factors that affect 'Behavioural Intention' to adopt e-Government services, is 'Effort Expectancy' (β =.244, p<.05), followed by 'Trust of CSC' (β = .200 p<.05). The third strongest construct is 'Trust of the Government' (β =.195, p<.01.), then 'Trust of the Iinternet' (β =.187, p<.01), 'Social Influence' (β =.126, p<.01) and finally 'Performance Expectancy' (β =.110, p<.05) representing less impact on 'Behavioural Intention'.

In terms of factors related to 'Usage Behaviour', the 'Behavioural Intention' is shown to have strongest impact on e-Government adoption followed by 'Facilitating Conditions' (β=.134, p.05). Concerning the demographic variables that were included in this study, all factors (i.e, age, gender, educational level and internet experience) were found to associate with the adoption of e-Government in Greece. Internet users show significantly more e-Government adoption than non-internet users.

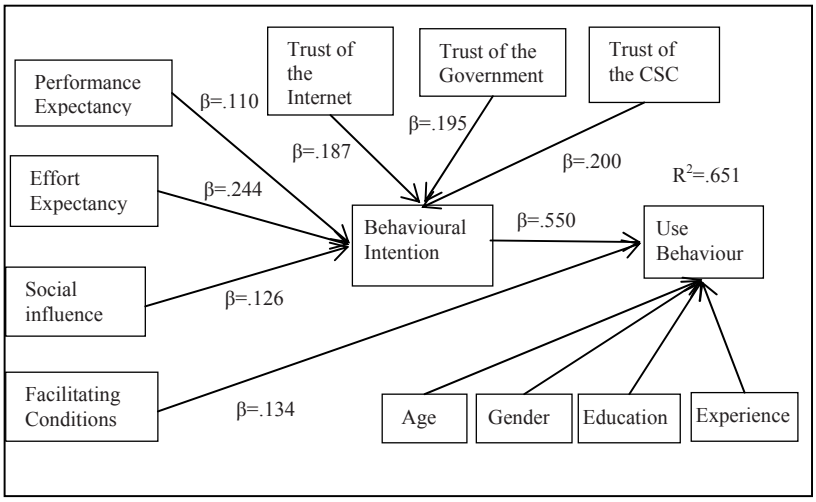

Fig. 2: Research Model and Factors Influencing Adoption of E-Government Services in Greece

4.1 Discussion

This study found that the most important factor influencing citizens' 'Behavioural Intention' to adopt e-Government services is 'Effort Expectancy'. 'Effort expectancy' is similar to 'ease of use' factor in other models (TAM, TPB) and is a major factor in system acceptance. E-services should be easy to use and learn. An intuitive interface is not enough [15]; proper support facilities, online help, and documentation should also be offered alongside the services.

'Trust' is found to be a very influential factor. Lack of trust and confidentiality is a major barrier to e-Government success [11, 18]. Moreover, the influence of 'trust' on e-Government adoption has been previously acknowledged in different contexts and this study found that CSCs play a key role in establishing trust between citizens and government. The citizen trust can be built with intermediaries like SCSs that facilitate the on-line interaction of the citizen with the government. The central role of an intermediary is to enhance communication between parties by building trust and reducing risks that occur as result of the inefficiencies of internet mechanisms

and the lack of information technology knowledge [19]. This enables the gradual transition of citizens to 'self-using' new technology.

'Trust of the Government' is highly dependent on the image of the organization providing the service, especially if e-Government is in its initial stages. Influencing 'trust in Government' is a long term effort. In the long run, government institutions should increase their reputation by establishing consistent government policies and inform citizens, looking after citizens' needs, fighting corruption and increasing the field of civil rights. In the short run, it can be achieved by using media tools to increase the awareness of the services.

'Trust of the Internet' that also influences 'Behavioural Intention' is dependent on the medium e-services are provided; internet should be a reliable technology and there should have taken the necessary security measures and performance structures of this electronic medium. Greek Government should make e-services and the internet more trustworthy; it has also to improve the legal infrastructure (laws for privacy, e-signature and knowledge acquisition law). Government institutions should improve the safeguards of information by better encryption mechanisms and secure servers. The public should be aware of the utilisation of these mechanisms through campaigns and also CSCs; Specifically CSCs should play a key role in guiding citizens in self-using web portals and informing about the gained benefits and practical implications.

In terms of e-Government usage, the analysis suggested that 'Facilitating Conditions' significantly explain 'Usage Behaviour'. Some citizens cannot access available e-Government services and this is related to digital divide (skills and access) and conversely, citizens with high skills and access to e-Government services may also be obstruct due to the lack of trust. Thus, the CSCs may overcome the above challenges by offering the skills needed to use the e-Government services, considering society segmentation, and lack of confidence in using online services.

The findings of the research are in line with other research undertaken in Saudi Arabia [20] that takes into account intermediaries. Similar results also have been obtained in another research regarding citizens' interaction with electronic services in the municipalities, in Attica [21]. They have found that citizens' interaction with municipal websites is mostly restricted to sourcing of information material rather, than to provision of services. A few reasons for this attitude revealed in the study include: citizens' concern for the safety of their personal data, low educational level and the complexity of municipal electronic services provided.

5. Weaknesses of the Research Project - Limitations

This study validated an extended UTAUT model on local government services for citizens. The empirical work can be further extended to cover other e-Government services beyond the municipal example used in this study. Despite that many e-services in Greece are offered by local government, we can not generalize on all e-Government services, because these e-services cover specific needs.

The second weakness is the case study (Municipality of Heraklion, Crete). There is need for more case studies to be conducted, on different government sites that differ in reputation, number and type of services (informational and transactional) in order to generalise on the findings. Last, there is remaining variance not adequately explained. Further research into uncovering these factors would be a worthwhile effort, increasing the explanatory power and the usefulness of the model.

6. Implications for policy makers

Findings contribute to theory by understanding the drivers of e-Government adoption at local government level as well as the role of the CSCs. This research has practical implications for practitioners, policy makers and web designers to the ways in which e-citizens might increase their willingness to interact online. It will also help strategy makers to further enhance delivery of e-services to citizens through multi-channel service delivery, and give direction for future research. Indeed, this study emphasises the very important channel and intermediary (CSC), other than the internet, to assist communication with citizens online and to act as a trusted gateway towards e-services. This clearly indicates that if the government works closely with CSCs, e-Government usage will increase in Greece. Further, for other behavioural intention items used in the study, it can be concluded that e-Government

websites alone do not influence citizens to adopt e-Government as citizens are likely to seek help (from CSCs) to interact with government online.

It is anticipated that it will stimulate discussion among the e-Government research community, particularly in Greece but also in other countries with similar characteristics across key variables, in the planning of e-Government uptake.

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